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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JOLLEY, KIRSTEN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/721,636

Applicant(s)

SUH ET AL.

Examiner

Kirsten C. Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-14 are pending in the application. Claims 1-6 have been withdrawn without traverse because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement.

Response to Arguments

2. The claim objections set forth in the prior Office action have been withdrawn in response to Applicant's amendments.

3. Applicant's arguments filed September 12, 2005 have been fully considered but they are not persuasive.

With respect to the rejections under 35 USC 112 of the phrase "high magnetic anisotropy," Applicant argues that the specification recites a high magnetic anisotropy energy may be about 7×10^7 erg/cm³. Applicant states that "Thus, the specification clarifies that a 'high magnetic anisotropy' would, *for example*, have an energy of about 7×10^7 erg/cm³. [emphasis added]" The Examiner notes that the disclosure on page 12, lines 3-4, of the specification of an energy of about 7×10^7 erg/cm³ is only one *example* of a high magnetic anisotropy energy; even Applicant's arguments state that the value is merely exemplary. There is no clear teaching or definition of what range of energies is covered by Applicant's claim recitation of "high magnetic anisotropy" in the specification, i.e., what other values are also considered "high magnetic anisotropy". Therefore it is the Examiner's position that the metes and bounds of the claims

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remain unclear, and one skilled in the art would not know if they are infringing Applicant's claims.

With respect to the rejections over the Hirokane reference, Applicant argues that Hirokane does not teach thermal treating of reading-out layer 3 wherein the crystalline structure of reading-out layer 3 is changed into a crystalline structure that has a high magnetic anisotropy such that a high magnetic anisotropy energy of reading-out layer 3 is coupled to recording layer 5. Applicant also argues that intermediate layer 4 weakens any magnetic anisotropy energy coupled between the reading-out layer 3 and the recording layer 5, thus it would not be possible to couple the high magnetic anisotropy energy of the reading-out layer 3 to the recording layer 5.

First, the Examiner notes that Hirokane states "when the film thickness of the intermediate layer 4 becomes large, the exchange-coupling strength which acts from the recording layer 5 to the reading-out layer 3 becomes too weak" (col. 9, lines 37-40). Therefore, even though intermediate layer 4 is present, the energy of reading-out layer 3 is still coupled to the recording layer 5. Further, it is noted that Hirokane also teaches a prior art embodiment (comparative samples) where an intermediate layer 4 is not present. In this case, the energy of the reading-out layer 3 is even more coupled to the recording layer 5. For example, Hirokane states in col. 7, lines 7-9, regarding the comparative sample "the exchange-coupling between the reading-out layer 3 and the recording layer 5 is very strong."

Second, as to the crystalline structure, the Examiner notes that the magnetization direction changes as a result of heating in Hirokane's reference. It is the Examiner's position that *some kind* of crystalline structure change must occur when the magnetization direction changes. Since the heating does not cause the compound to change chemically (i.e., the

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chemical formula does not change), the magnetization direction change must be due to a structural/physical change. Third, regarding the “high magnetic anisotropy,” it is noted that “high” is a relative term of degree and, because the limits of the phrase are not defined in the specification (as discussed in the 35 USC 112 rejection), it is the Examiner’s position that the magnetic anisotropy is high as compared to any other layer having a lower magnetic anisotropy. Hirokane states that there is in-plane magnetic anisotropy in col. 9, line 16.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 7 and 11, line 7 of each, the phrase “high magnetic anisotropy” is vague and indefinite because “high” is a relative term of degree, and therefore the metes and bounds of the claims are not known. The specification does not define the limits of “high magnetic anisotropy,” and (as argued above) one skilled in the art would not know if he/she is infringing the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 7-9 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirokane et al. (US 5,863,649).

Hirokane et al. discloses a method for fabricating a magneto-optical storage medium comprising the steps of: forming a sublayer (reading-out layer 3) of GdFeCo which contains a transition metal (Fe); forming a recording layer 5 on which information is recorded and stored; and recording on the medium which includes a thermal treatment. Hirokane et al. discloses use of a high temperature to change the magnetization of the sublayer/reading-out layer in col. 4, lines 43-60, col. 7, line 67 to col. 8, line 2, col. 10, lines 42-46, and col. 11, lines 40-44; such a change in magnetization results from a change in crystalline structure of the layer. The magnetic anisotropy energy of the sublayer/reading-out layer 3 is coupled to the recording layer 5, as evidenced by col. 9, lines 37-40. As to claims 8-9 and 12-13, Hirokane et al. teaches that the recording layer 5 may be TbFeCo (col. 13, lines 1-3). In this case, the sublayer (reading-out layer 3) is made up of an alloy containing a transition metal used for the recording layer.

Allowable Subject Matter

8. Claims 10 and 14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Claims 10 and 14 are allowable over the prior art for the reasons discussed in the prior Office action.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kirsten C Jolley
Primary Examiner
Art Unit 1762

kcj